**Highlights:**

1.The best low-temperature pretreatment days and hormone concentration for anther cultures of awnless triticale were determined in this manuscript.

2.The best low-temperature pretreatment days for anther cultures of awnless triticale was 15 d.

3. The best hormone concentration for anther cultures of awnless triticale was 1.5 mg/L 2,4-D + 1.5 mg/L KT.

4. Among the 36 regenerated green plants that were grown in the field, The 9 DH1 plants reached the standard of awnless triticale, which could be used as materials for breeding new awnless triticale varieties.